

# Laryngotracheal Transection in Blunt Trauma of the Neck

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## ABSTRACT

Laryngotracheal injuries are relatively rare following blunt trauma to the neck and chest but results in a high degree of morbidity and mortality. Complete disruption of the trachea is extremely rare and a systematic approach is needed for early diagnosis and management. The symptoms and physical signs do not necessarily correlate with the severity of injury as was observed in the presented cases here. An early diagnosis and surgical exploration is a must for a reasonably favourable outcome.

*Key words : Tracheal rupture, Trauma.*

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## INTRODUCTION

Accidents during harvesting season are common in rural areas. Loose clothings traditionally worn by the workers get entangled in power machines and may cause crushing neck injuries. Laryngotracheal injuries carry a very high mortality rate<sup>1</sup>. A high degree of suspicion in all the agricultural accidents leads on to prompt diagnosis. Only an urgent surgical exploration can ensure a long term good outcome. Rarely, there is a complete laryngotracheal rupture and separation in blunt agricultural injuries without much injury to the skin of the neck may prove fatal if not diagnosed<sup>2</sup>.

Three such cases of laryngotracheal transection are described, all of whom had sustained crushing injuries due to accidental entrapment of loose clothings around their neck.

## CASE REPORTS

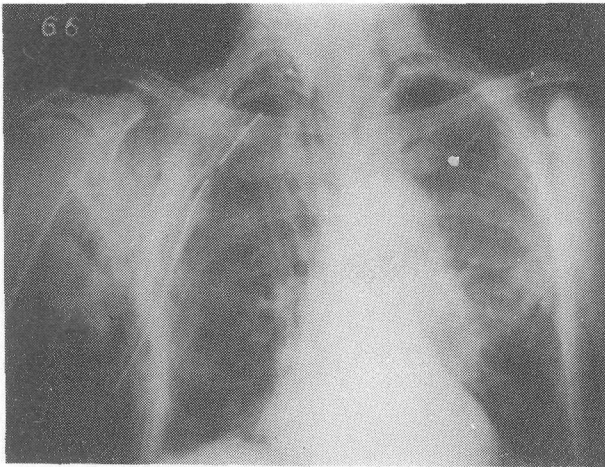
### Case 1

A 28-year-old male with multiple injuries was brought to the casualty section of our hospital

about 6 hrs after blunt injury to the neck and chest due to accidental entanglement of bed sheet around his neck by a power machine while working in a rice mill. He presented with respiratory distress and a progressively increasing swelling over neck and face.

Examination revealed dislocation of the right hip, fracture of 5<sup>th</sup> right rib and a compound comminuted fracture of the left humerus. A massive surgical emphysema was present on the neck and chest (Figure). Except for slight bruises on the neck there was no other evidence of external injury.

The chest radiograph showed pneumothorax with collapse of the left lung. Chest tube was put in the left 5<sup>th</sup> intercostal space. While performing tracheostomy, the thyroid and cricoid cartilages were found to be shattered completely and the trachea was found to be completely separated from the crushed larynx. The trachea was secured with stay sutures and the endotracheal tube was inserted into it from the oral cavity. Meanwhile there was a sudden drop in the blood pressure, and further surgery was abandoned and patient



**Figure.** Chest radiograph (PA view) showing extensive emphysema over neck and chest.

was resuscitated. The chest tube was removed after seven days, after a repeat chest radiograph showed expanded lung on the left side.

Subsequently, he developed jaundice and surgery was further deferred. On 13<sup>th</sup> day, the patient had a profuse bleeding from the tracheostomy site which was explored under general anaesthesia but no major bleeder was found. Asai laryngoplasty<sup>3</sup> was done using a skin flap to connect the pharynx with the tracheal stump and the local wound closed with advancement flaps. At the same sitting, the left humerus was fixed internally using K-wire. The patient was discharged with a permanent tracheostomy and a reasonable voice.

### Case 2

A 40-year-old male had received a blunt injury following accidental strangulation due to the entrapment of his muffler in a thrasher. Since the patient lived in a remote area, he was brought one day later to the hospital. He presented with a massive swelling over the neck and face, and respiratory distress. There were no signs of external trauma. On examination, he was found to be dyspnoeic and cyanosed. The patient had intermittent bouts of haemoptysis. A chest radiograph showed a complete right lung opacity.

While performing emergency tracheostomy, it was observed that there was tracheal rupture and retraction of trachea in the neck. The lower end

of trachea was pulled up and sutured with the skin. Since the condition of the patient did not allow any major surgical exploration, a chest tube was placed in the right 5<sup>th</sup> intercostal space without much relief. He had aspirated blood from the severed trachea in the left lung which was drowned in his own blood. He died of gram negative septicemia within 24 hours before any surgery could be undertaken.

### Case 3

A 20-year-old farmer was admitted 3 hours after a crushing injury of the neck sustained while working on a thrasher. He presented in mild shock, breathing with considerable difficulty and with signs of subcutaneous emphysema over face and neck, which were rapidly increasing. There were no other injuries. The patient was immediately taken up for surgery.

On exploration, the thyroid and cricoid cartilages were found to be totally crushed, and there was a complete separation of the trachea from the larynx. The trachea was found to be retracted into the chest. The laryngeal framework was beyond repair, hence the laryngopharynx was closed and the lower end of transected trachea was sutured with the skin to make it a permanent tracheostomy. He was discharged on the 10<sup>th</sup> day with normal swallowing, permanent tracheostomy and no voice *i.e.*, akin to total laryngectomy. The patient could, however, speak with the aid of an artificial larynx.

## DISCUSSION

Laryngotracheal injuries constitute only a small fraction of admissions in a major trauma centre. The frequency has been reported to be as low as 0.3 percent<sup>4</sup>. However, mortality is reported as high as 24 percent<sup>1</sup>. Complete disruption of trachea is amongst the rarest injuries with only a few cases reported in literature<sup>5</sup>. Seuvre (cited by Papamicheal *et al*<sup>6</sup>) is credited with the first description of traumatic tracheal disruption. Direct blows are more likely to be associated with fractures of cartilaginous frame work of the larynx<sup>7</sup>. The signs and symptoms are often subtle even in complete transections of trachea. The two

ends may be held in close approximation by peritracheal connective tissue and soft tissues of the neck.

Clinical features include subcutaneous surgical emphysema, pneumothorax, respiratory distress, haemoptysis and loss of palpable landmarks<sup>8</sup>. Most of these features were present in our cases except pneumothorax which was seen only in the first case. The signs and symptoms are non specific and correlate poorly with the severity of the underlying injury<sup>9</sup>. Therefore, a high degree of suspicion and a more aggressive approach towards diagnosis and management is required as delayed treatment may prove fatal as in our second case.

Neck and chest radiographs though essential cannot be completely relied upon. CT scan or MRI if available can give accurate diagnosis, otherwise direct laryngoscopy and bronchoscopy can be utilised to confirm the diagnosis as delay leads to a poor prognosis<sup>7</sup>.

Management includes, tracheostomy and early surgical repair. The best results are obtained with a complete repair of the larynx and trachea with end to end anastomosis of disrupted trachea which avoids a permanent tracheostomy and patient retains a good voice. The second best option is a permanent tracheostomy which means a loss of voice.

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